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	Application No.	Applicant(s)
Notice of Allowability	10/644,363	SUMANAWEERA ET AL
	Examiner	Art Unit
	Jaworski Francis J.	3737

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *amdt 11/21/05*.

2. ☒ The allowed claim(s) is/are *1 - 27*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some*   c) ☐ None   of the:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____ .

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of

      Paper No./Mail Date _____ .

    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date <u>11-21-05</u>

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)

6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .

7. ☒ Examiner's Amendment/Comment

8. ☐ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

Francis J. Jaworski
Primary Examiner

REASONS FOR ALLOWANCE/Exr's Amendment

The following is an examiner's statement of reasons for allowance: Wood

(US5283837) is directed to non-specific medical image processing in which discussion

is made of depth shading as in proportion to the viewing plane distance, depth gradient

shading as in degree of surface inclination with respect to the orthogonal viewing

normal, grey scale surface gradient-based shading alternative to the use of depth or

view angle as prior-described, or a variant in which grey scale variations are determined

along orthogonal axes in a matrix form, (all practiced on voxel datums and not involving

resampling to raylines representing the viewing angle); Argiro (US6130671) is directed

to volume rendering as a substitution projection onto a plane of sets of point samples

associated with a single displayed point, to object order compositing where display

voxel values are composited using an image plane and to an inventive dot product of

the surface gradient and the viewing direction vector, in the voxel diomain and without

shading as a function of viewing angle together with resampling along raylines

representative of viewing angle. Arata (US5689577) uses an alternative triangular

mesh approximation for medical object surface depiction where triangles thinned by the

progressive contour triangle approximation are vertex-merged using the dot product

relationship of the normal vector of a given mesh unit and average normal vector as per

Fig. 3. Vining (US6366800) is directed to enhanced viewing of endoscopically detected

abnormalities where a wire-frame three-dimensional rendering of a virtual colon is

viewable from the interior and exterior by using a view parallel to the normal of a

surface population section and centered on its centroid. Sumanaweera et al

(US6852061, of record with the IDS filed 11/21/05) was considered but while claiming is made of volume rendering from an acoustic grid it neither discloses nor claims spatial gradient operations or the resampling of ultrasound data to raylines after shading as a function of viewing angle and/or in an acoustic domain.

None of the prior art alone or in combination teaches or suggests a method or a beamformer and graphics processor for computing spatial gradients in a medical image including determining a spatial gradient vector in an acoustic domain and then transforming the result to a Cartesian domain, or a method for resampling acoustic domain data to view angle raylines with gradient determination from the re-sampled data, or a spatial derivative computing process in which the ultrasound data is shaded as a function of viewing angle and then re-sampled to raylines representing the viewing angle.

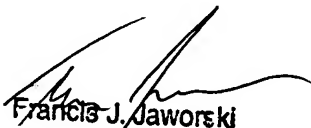The status of the related case has been updated to indicate its patented status:

Spec. page 4 line 5 and page 20 line 6 after "No." has been added -- 6,852,081 --.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication should be directed to Jaworski Francis J. at telephone number 571-272-4738.

FJJ:fjj

Francis J. Jaworski
Primary Examiner